

LITTLE MILK

Cows are not to blame, it's the fodder that has been infected

Researchers identify cause of Napier grass disease that has led to low yield by dairy cows, but they have yet to find its remedy

By COSMAS BUTUNYI

Mzee Johnstone Chweya is a desperate man. He can barely find enough fodder to feed his prized Friesian cow, which he rears by zero grazing.

His once lush Napier grass field has been reduced to stunted yellowish shoots. And because his cow has little to eat, his milk output has fallen from a daily output of over 20 litres to less than five litres.

Though his Ebukanga Village in Vihiga District receives sufficient rainfall, the yield from his Napier crop is dwindling.

After consulting an agricultural extension officer, he was informed that his field was affected by the Napier stunt disease- which has no known cure.

Like Mzee Chweya, many other farmers in Western Kenya have been hard-hit by the disease and scientists have predicted a bleak future for the dairy industry if it goes unchecked.

"The Napier stunt disease will wipe out all the Napier in this country in the next five years if nothing is done about it," says Dr. Zeyaur Khan, a researcher at the International Centre of Insect Physiology and Ecology (*icipe*).

Buying Napier grass.

But he is looking at the big picture. For farmers like Mzee Chweya, they have to find a solution to declining fodder. And that means buying Napier grass from those whose fields have not been affected.

While an acre of Napier grass can provide enough to sustain four cows, plots affected by the disease can only support one or two animals, greatly reducing milk yields and incomes for affected dairy farmers.

Because the demand is high, the price of Napier grass has gone up.

Initially, Mzee Chweya used to buy the fodder from his neighbors at sh50 per bundle to supplement his diseased crop but this too has now been affected.

Keeping his cow is now ten times more expensive than before. He now has to buy and transport the Napier from far away farms.

Mzee Chweya is even considering selling his cow because of lack of fodder.

The Napier stunt disease, Dr.Khan says, has led to huge losses, with smallholder dairy farmers being the hardest hit. This has threatened the viability of the small holder dairy industry.

Between 50 and 60 per cent of the Napier plants in western Kenya have been affected by the disease.

Free from disease

"A survey of the Napier from *icipe*'s Thomas Odhiambo Campus at Mbita Point found that out of 100 samples ,only two were free from Napier stunt disease", says Dr. Khan

Finding a disease-free Napier field has become difficult Since it takes a long time for symptoms to manifest themselves on infected plants, a healthy

crop may suddenly look infected. 'The disease shows symptoms after about six months to one year from the time of infection,' says an *icipe* researcher, Mr. Simon Degelo.

The disease has been present in eastern Africa for about 30 years but it has become



ABOVE: A farmer holds diseased Napier grass uprooted from his field in Vihiga District. BELOW: Dr. Zeyaur Khan, a researcher at the International Centre of Insect Physiology and Ecology inspects a Napier grass field infected with stunt disease, which has been blamed for declining milk production in some parts of western Kenya.

more noticeable in the last five years.

Until a few years ago, the cause of the disease was unknown. Researchers thought it was either caused by a fungus, nematode damage or a nutrient deficiency.

It was not until 2004 that the cause was identified. And it was traced to a specialized bacteria called phytoplasma, which multiplies in the Napier plant material.

"The phytoplasma is a parasite on the plant phloem tissue," says Dr. Khan.

Sap-sucking insects

The disease is introduced in Napier field when disease cuttings are used for vegetative propagation of new plants.

"It is then transmitted in the field by unknown sap-sucking insects," he explained.

icipe was assigned the job of identifying the vector at a meeting in Addis Ababa.

The discovery of the transmitting vectors, researchers argue, was the missing link to combating the disease.

The knowledge will be used to develop Napier grass varieties that are resistant to phytoplasma and the vector.

So far, Dr. Khan says, *icipe* researchers have narrowed the transmitting vectors to two categories of phloem-sucking insects: leaf-hoppers and plant-

hoppers, which belong to the same family as grasshoppers and crickets.

"We have identified at least 12 species of leaf-hoppers and three species of grass-hoppers with help from international taxonomists," Says Dr. Khan.

But research is ongoing to identify the particular species that act as vectors of the phytoplasma before a variety of Napier grass that is resistant to it can be developed.

"Preliminary results indicate that both insects could potentially transmit phytoplasma, since plant-hopper species feed exclusively on phloem tissue whereas leaf-hoppers feed on both phloem and xylem." Says Mr. Degelo, who is involved in the research.

He is investigating the feeding habits of the insects and their rates of feed assimilation.

"The Napier stunt disease is transmitted in a manner similar to malaria," says Dr. Khan. Only the female anopheles is the vector for malaria.

icipe is currently developing a control strategy against the Napier stunting disease to combat its spread.

At present, the basic control measure is to dig

2004

The year when the cause of the Napier stunting disease was found

up the infected plants and replace them with healthy ones.

"The soil around infected plants cannot harbor the disease, so replanting in the same place is possible," advises Dr. Khan.

Leaves of diseased plants are also harmless to livestock and the dung can still be used as manure since the phytoplasma does not persist in the manure.

But the roots of the infected plants should be burned, says Dr Khan.

Since planting materials play a major role in transmission of the disease, farmers should be helped to identify healthy cuttings.

"Trans Nzoia is one of the areas where the Napier stunt disease has low prevalence," Dr. Khan adds.

Napier, also called elephant grass, is a perennial grass widely grown in East Africa as a fodder crop.

It also helps in environmental protection by acting as a wind breaker besides stabilizing soils.

Moreover the plant is used as a trap plant in the recently launched push-pull technology developed by *icipe* to combat weeds and stem borers.

Under the technology, one-meter wide border of Napier grass is planted around a maize field to trap stem borers.

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